Epiglottic obstruction and its anatomical measurements from sleep CT

Li-Jen Hsin, MD[1], Li-Ang Lee, MD, FICS[1], Hsueh-Yu Li, MD, FACS, FICS[1], Tuan-Jen Fang, MD, FICS[1], Wan-Ni Lin, MD[1], Yu-Lun Lo, MD[2], Ning-Hung Chen, MD[2], Chao-Jan Wang, MD[3]

Department of Otolaryngology-Head and Neck Surgery, Sleep Center, Linkou-Chang Gung Memorial Hospital, Chang Gung University, Taoyuan, Taiwan[1]

Department of Thoracic Medicine, Sleep Center, Linkou-Chang Gung Memorial Hospital, Chang Gung University, Taoyuan, Taiwan[2]

Department of Medical Imaging and Intervention, Sleep Center, Linkou-Chang Gung Memorial Hospital, Chang Gung University, Taoyuan, Taiwan[3]

Objective: The significance of the upper airway collapse at the epiglottis have yet been well established among obstructive sleep apnea (OSA) patients. We intend to examine the correlation between the extent of epiglottic collapse and anatomical measurements of the epiglottis from measurements of sleep CT imaging.

Methods: *Study Design:* prospective cohort study

Year(s)/Month(s) Study Conducted: 10 months. (2014/5 - 2015/3)

Disease/Condition Studied: OSAS patients confirmed by laboratory PSG

Subjects Studied: 35

Setting: tertiary referral center / *Intervention*: none

Outcome Measurements: the degree of epiglottic obstruction at sleep state (SE) was categorized by 2 observers according to midline sagittal CT imaging. Zero represents less than 50% obstruction and 1 and 2 represent 50-75% and larger than 75% obstruction, respectively.

Independent Variables: The length of the epiglottis (from its free edge to the base) and the angle (the angle between the long axis of the epiglottis and the vertical plane) during awake state

Results: The average age was 40 (24-67) years, BMI was 26.8 kg/m^2 (sd 3.1), and AHI was 54.9 per hour (sd 28.0). The length from SE=2 was significantly higher then SE=1 (21.99 ± 4.32 vs. 16.75 ± 2.15 cm, p = 0.008) whereas the angle difference was not significantly different among groups (p = 0.73 for SE=0 vs SE=1 and p = 0.43 for SE=1 and SE=2). A moderate to high positive correlation was found between SE and the length of epiglottis (rho = 0.69, $p < 0.001$).

Conclusion: In patients with OSA, the extent of obstruction seen from the sleep CT study was correlated the length of the epiglottis instead of the angle of the long axis of the epiglottis measured from the awake state. This may provide useful information in the evaluation of the epiglottis level considering the extent of their possible obstruction.

中文題目：睡眠斷層影像會厭部阻塞與其解剖構造之分析

作　　者：辛立仁醫師[1]，李立昂醫師[1]，李學禹醫師[1]，方端仁醫師[1]，林婉妮醫師

[1]，羅友倫醫師[2]，陳濘宏醫師[2]，王超然醫師[3]

辛立仁醫師與李立昂醫師為共同第一作者。

服務單位：林口長庚紀念醫院 長庚大學 耳鼻喉科、睡眠中心[1]
林口長庚紀念醫院 長庚大學 胸腔內科、睡眠中心[2]
林口長庚紀念醫院 長庚大學 影像診療科、睡眠中心[3]